

WHAT IS CLAIMED IS:

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1. A heart valve leaflet fastener comprising at least one pair of arms, the pair having a suitable size for fastening heart valve leaflets and the pair of arms capable of fastening two adjacent leaflets, wherein the arms pivot from one orientation to a gripping position with at least a portion of each respective paired arms being directed toward each other.
  2. The heart valve leaflet fastener of claim 1 wherein the arms flex relative to a core, and wherein the fastener has a gripping position where each the pair of arms meet under tension.
  3. The heart valve leaflet fastener of claim 1 wherein one of the arms of each pair includes a projection for gripping a leaflet.
  4. A kit comprising a cardiac catheter, a fastener applicator and a leaflet fastener of claim 1, the cardiac catheter having suitable dimensions for deployment and insertion into a human heart in the vicinity of the mitral or tricuspid valve, the leaflet fastener having a size allowing insertion through the cardiac catheter, the fastener applicator being capable of releasably holding the leaflet fastener.
  5. The kit of claim 4 wherein the paired arms comprise gripping elements that extend toward each other when the fastener is in a gripping position.
  6. The kit of claim 4 wherein the opposed arms of a pair of arms comprise a pointed tip and a clasp that engage each other in the gripping position.
  7. The kit of claim 4 wherein the arms flex to a low profile position to fit within the cardiac catheter.
  8. The kit of claim 4 wherein the fastener applicator comprises a shaft and a sleeve that slides over the shaft and wherein at least one member of the
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pair of arms slides along the shaft with the sleeve engaging the sliding arms to constrain their movement along the shaft.

9. The kit of claim 8 wherein the arms can slide along the shaft between a low profile position for fitting within the cardiac catheter and an extended gripping position for gripping leaflets.

10. The kit of claim 4 wherein the arms pivot between a low profile position and an unconstrained extended position.

11. The kit of claim 4 wherein the fastener applicator comprises a shaft and a bayonet fastener that releasably holds the leaflet fastener on the shaft.

12. The kit of claim 4 wherein the fastener applicator comprises a shaft and a latch that releasably holds the leaflet fastener on the shaft.

13. A device comprising a catheter, a leaflet fastener applicator and a leaflet fastener of claim 1, the catheter having a proximal end, a distal end and suitable dimensions for insertion into a heart, the leaflet fastener applicator passing through the catheter such that an actuating element projects from the proximal end of the catheter while a fastening element projects from the distal end of the catheter, the leaflet fastener applicator releasably holding the leaflet fastener.

14. A heart valve repair instrument comprising a ring and an applicator, wherein the ring comprises two pointed shafts and wherein the applicator can apply a force to the ring to deform the ring to bring the points of the shafts toward each other relative to an initial position, the ring and applicator having an appropriate size for placement within a chamber of a human heart.

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15. The instrument of claim 14 wherein the ring comprises a curved tube extending from one pointed shaft into which the second pointed shaft extends.

16. The instrument of claim 15 wherein the ring further comprises a spring within the tube between the respective pointed shafts and a releasable lock that can hold the second pointed shaft within the tube in a locked position and wherein the force applicator can apply a force to release the lock.

17. The instrument of claim 14 wherein the two pointed shafts extend from a notch that is a weak point at which the ring can be deformed to direct the pointed shafts toward each other.

18. A heart valve repair instrument comprising a shaft, a cap, a gripper and a flexible rod, wherein the gripper comprises a plurality of arms radiating from a pivot with each arm having a spike, wherein the cap is located distal to the pivot and the pivot is located distal to the shaft, and wherein the flexible rod connects to the cap to provide for movement of the cap relative to the gripper and the shaft by pulling the flexible rod, the cap having an opening that can be inserted over the pivot to lock the arms in a closed position.

19. The instrument of claim 18 wherein the plurality of arms comprise pairs of arms connected by a resilient web.

20. The instrument of claim 18 wherein the pivot is formed from spring metal or memory metal.

21. The instrument of claim 20 wherein the plurality of arms comprises two pairs of arms wherein pairs of arms are connected by a resilient web.

22. The instrument of claim 21 wherein the web is covered with fabric.

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| Country | Year | Age | Sex | Height | Weight | Body Mass Index | Waist Circumference | Hip Circumference | Waist-Hip Ratio | Trunk Fat | Visceral Fat | Subcutaneous Fat | Trunk Fat | Visceral Fat | Subcutaneous Fat |
|---------|------|-----|-----|--------|--------|-----------------|---------------------|-------------------|-----------------|-----------|--------------|------------------|-----------|--------------|------------------|
| Germany | 1990 | 25  | M   | 175    | 75     | 24.5            | 85                  | 95                | 0.89            | 15        | 10           | 5                | 15        | 10           | 5                |
| France  | 1990 | 25  | M   | 175    | 75     | 24.5            | 85                  | 95                | 0.89            | 15        | 10           | 5                | 15        | 10           | 5                |
| Italy   | 1990 | 25  | M   | 175    | 75     | 24.5            | 85                  | 95                | 0.89            | 15        | 10           | 5                | 15        | 10           | 5                |
| Spain   | 1990 | 25  | M   | 175    | 75     | 24.5            | 85                  | 95                | 0.89            | 15        | 10           | 5                | 15        | 10           | 5                |
| Sweden  | 1990 | 25  | M   | 175    | 75     | 24.5            | 85                  | 95                | 0.89            | 15        | 10           | 5                | 15        | 10           | 5                |
| Japan   | 1990 | 25  | M   | 175    | 75     | 24.5            | 85                  | 95                | 0.89            | 15        | 10           | 5                | 15        | 10           | 5                |
| USA     | 1990 | 25  | M   | 175    | 75     | 24.5            | 85                  | 95                | 0.89            | 15        | 10           | 5                | 15        | 10           | 5                |

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33. A kit comprising the fastening member of claim 30 and a flexible rod, the flexible rod has a disengaging mechanism that permits the flexible rod to releasably hold the cap.